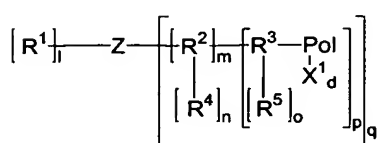


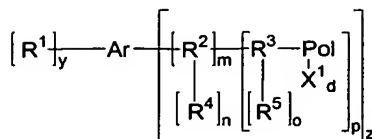
What is claimed is:

1. A polymer based on polyvinyl esters of the formulae **VI**, **VII** and **VIII**

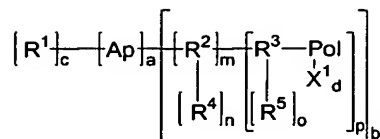
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formula **VI**



formula **VII**



formula **VIII**

where

10 Pol is a polymer based on a polyvinyl ester, and is more preferably a homo- or copolymer based on polyvinyl acetate,

Z is a central atom and is an atom of group 13 to 16 of the Periodic Table of the Elements, preferably carbon, 15 silicon, nitrogen, phosphorus, oxygen or sulfur, more preferably carbon or silicon, and

X<sup>1</sup> is in each case the same or different and is a halogen atom, preferably fluorine, chlorine, bromine or iodine, more preferably chlorine, bromine or iodine, and

20 R<sup>1</sup> is the same or different and is hydrogen or a C<sub>1</sub>-C<sub>20</sub> group, and

R<sup>2</sup> is the same or different and is a bridging C<sub>1</sub>-C<sub>20</sub> group between the central atom Z and the initiating [R<sup>3</sup>-X<sup>1</sup>] unit or silicon or oxygen, and

25 R<sup>3</sup> is the same or different and is carbon or silicon, and

R<sup>4</sup> is the same or different and is a hydrogen atom or a C<sub>1</sub>-C<sub>20</sub> group, and

R<sup>5</sup> is the same or different and is hydrogen or a C<sub>1</sub>-C<sub>20</sub> group,

30 l is a natural integer and is zero, 1, 2 or 3, and

m is in each case the same or different and is a natural integer and is zero, 1, 2, 3, 4 and 5, and

n is in each case the same or different and is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20, and

o is in each case the same or different and is 1 or 2, and

5 p is in each case the same or different and is a natural integer and is 1, 2, 3, 4 and 5, and

q is a natural integer and is 2, 3 and 4, and

Ar is an aromatic basic structure having at least four carbon atoms, in which one or more carbon atoms may be exchanged for boron, nitrogen or phosphorus, preferred aromatic or heteroaromatic basic structures being derived from benzene, biphenyl, naphthalene, anthracene, phenanthrene, triphenylene, quinoline, pyridine, bipyridine, pyridazine, pyrimidine, pyrazine, triazine, benzopyrrole, benzotriazole, benzopyridine, benzopyrazidine, benzopyrimidine, benzopyrazine, benzotriazine, indolizine, quinolizine, carbazole, acridine, phenazine, benzoquinoline, phenoxazine, each of which may also optionally be substituted, and

10 y is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20, and

z is a natural integer and is 2, 3, 4, 5, 6, 7, 8, 9 and 10,

Ap is a cyclic nonaromatic basic structure having at least three carbon atoms which may also contain heteroatoms such as nitrogen, boron, phosphorus, oxygen or sulfur, preferred aliphatic basic structures being derivable from the group of cycloalkyl, for example cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclononyl, or from the cycloheteralkyl group, for example aziridine, azetidine, pyrrolidine, piperidine, azepane, azocane, 1,3,5-triazinane, 1,3,5-trioxane, oxetane, furan, dihydrofuran, tetrahydrofuran, pyran, dihydropyran, tetrahydropyran, oxepane, oxocane, or from the group of

20

25

30

the saccharides, for example alpha-glucose, beta-glucose, and

a is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20, and

5 b is a natural integer and is 2, 3, 4, 5, 6, 7, 8, 9 and 10, and

c is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20,

d may be the same or different and is zero or one.

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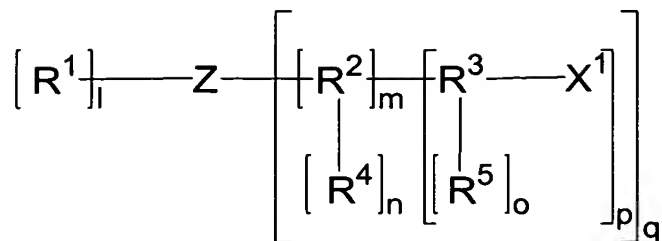
2. The polymer as claimed in claim 1, characterized in that Pol is a copolymer based on a polyvinyl ester having one or more 1-olefins having from 4 to 20 carbon atoms.

15 3. The polymer as claimed in claim 1, characterized in that Pol is a homopolymer based on polyvinyl acetate.

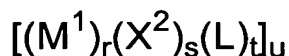
4. The polymer as claimed in claim 1, characterized in that Pol is a copolymer based on polyvinyl acetate having one  
20 or more 1-olefins having from 4 to 20 carbon atoms.

5. The use of the polymers as claimed in one or more of claims 1 to 4 as additives for fuels and motor oils, as additives for concrete, as additives in papermaking, as  
25 an adhesive (component), as a lubricant, as a lacquer component, as a high-performance plastic and as a starting material for the preparation of polymers based on polyvinyl alcohol and polyvinyl butyral.

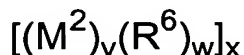
30 6. An initiator system for preparing polyvinyl esters, comprising at least one compound of the formula I, at least one metal compound of the formula II and optionally at least one additive of the formula III:



formula I



formula II



formula III

5

10 where:

Z is a central atom and is an atom of group 13 to 16 of the Periodic Table of the Elements, preferably carbon, silicon, nitrogen, phosphorus, oxygen or sulfur, more preferably carbon or silicon, and

15  $X^1$  is in each case the same or different and is a halogen atom, preferably fluorine, chlorine, bromine or iodine, more preferably chlorine, bromine or iodine, and

$R^1$  is the same or different and is hydrogen or a  $C_1$ - $C_{20}$  group, and

20  $R^2$  is the same or different and is a bridging  $C_1$ - $C_{20}$  group between the central atom Z and the initiating  $[R^3-X^1]$  unit or silicon or oxygen, and

$R^3$  is the same or different and is carbon or silicon, and

$R^4$  is the same or different and is a hydrogen atom or a  
25  $C_1$ - $C_{20}$  group, and

$R^5$  is the same or different and is hydrogen or a  $C_1$ - $C_{20}$  group,

1 is a natural integer and is zero, 1, 2 or 3, and

m is in each case the same or different and is a natural integer and is zero, 1, 2, 3, 4 and 5, and

n is in each case the same or different and is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20, and

o is in each case the same or different and is 1 or 2, and

p is in each case the same or different and is a natural integer and is 1, 2, 3, 4 and 5, and

q is a natural integer and is 2, 3 and 4, and

10 M<sup>1</sup> is in each case the same or different and is a transition metal of group 3 to 12 of the Periodic Table of the Elements, preferably chromium, molybdenum, ruthenium, iron, rhodium, nickel, palladium or copper, more preferably iron or ruthenium, and

15 X<sup>2</sup> is in each case the same or different and is oxygen or a halogen atom, more preferably fluorine, chlorine, bromine or iodine, and

L is in each case the same or different and is a ligand, preferably a carbon ligand, for example methyl, phenyl, 20 cymene, cumene, tolyl, mesityl, xylyl, indenyl benzylidene, cyclopentadienyl or carbonyl, a nitrogen ligand, for example triethylamine, tetramethylethylenediamine, pyridine, 2,2'-bipyridyl, substituted 2,2'-bipyridyl, 1,10-phenanthroline, phenylpyridin-2-ylmethylenamine, acetonitrile, substituted imidazolidine or 25 terpyridyl, a phosphorus ligand, for example triphenylphosphine, tricyclohexylphosphine, bis(diphenylphosphino)ethane, bis(diphenylphosphino)propane or BINAP, and

r is in each case the same or different and is a natural integer and is 1, 2, 3, 4 and 5, and

30 s is in each case the same or different and is a natural integer and is zero, 1, 2, 3, 4 and 5, and

t is in each case the same or different and is a natural integer and is zero, 1, 2, 3, 4 and 5, and

u is a natural integer and is 1, 2, 3, 4 and 5, and  
 M<sup>2</sup> is the same or different and is an element of group 1 to 15 of the Periodic Table of the Elements, more preferably Li, Mg, Ti, B, Al, P or N, and

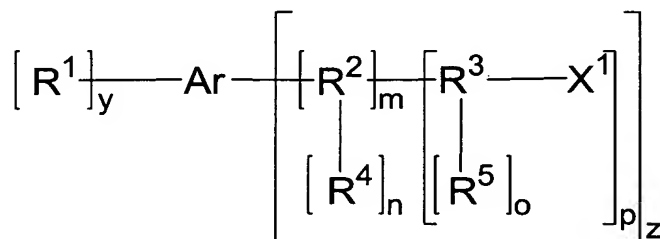
5 R<sup>6</sup> is the same or different and is hydrogen, a halogen atom or a C<sub>1</sub>-C<sub>20</sub> group, more preferably methoxy, ethoxy, n-propoxy or i-propoxy, and

v is the same or different and is a natural integer and is 1, 2, 3, 4, 5, 6, 7 and 8, and

10 w is the same or different and is a natural integer and is 1, 2, 3, 4, 5, 6, 7 and 8, and

x is a natural integer and is 1, 2, 3, 4, 5, 6, 7 and 8.

6. The initiator system as claimed in claim 5, characterized  
 15 in that it, instead of the compound of the formula I comprise, at least one compound of the formula IV



formula IV

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where

Ar is an aromatic basic structure having at least four carbon atoms, in which one or more carbon atoms may be exchanged for boron, nitrogen or phosphorus, preferred aromatic or heteroaromatic basic structures being derived from benzene, biphenyl, naphthalene, anthracene, phenanthrene, triphenylene, quinoline, pyridine, bipyridine, pyridazine, pyrimidine, pyrazine, triazine, benzopyrrole, benzotriazole, benzopyridine, benzopyrazidine, benzo-  
 25 pyrimidine, benzopyrazine, benzotriazine, indolizine,  
 30

quinolizine, carbazole, acridine, phenazine, benzoquinoline, phenoxazine, each of which may also optionally be substituted, and

$R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  are each as defined in claim 5, and

5  $m$ ,  $n$ ,  $o$ ,  $p$  are each as defined in claim 5, and

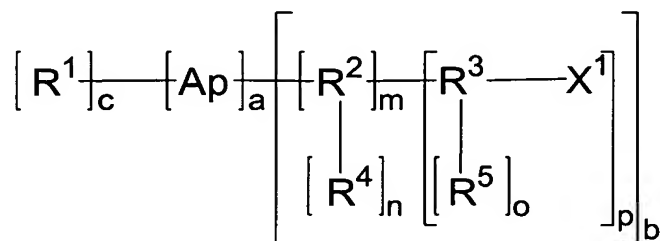
$X^1$  is as defined in claim 5, and

$y$  is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20, and

10  $z$  is a natural integer and is 2, 3, 4, 5, 6, 7, 8, 9 and 10.

7. The initiator system as claimed in claim 5, characterized in that it, instead of the compound of the formula I comprise, at least one compound of the formula V:

15



formula V

where

20  $Ap$  is a cyclic nonaromatic basic structure having at least three carbon atoms which may also contain heteroatoms such as nitrogen, boron, phosphorus, oxygen or sulfur, preferred aliphatic basic structures being derivable from the group of cycloalkyl, for example cyclopropyl, 25 cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, cyclononyl, or from the cycloheteralkyl group, for example aziridine, azetidine, pyrrolidine, piperidine, azepane, azocane, 1,3,5-triazinane, 1,3,5-trioxane, oxetane, furan, dihydrofuran, Tetrahydrofuran, pyran, 30 dihydropyran, tetrahydropyran, oxepane, oxocane, or from

the group of the saccharides, for example alpha-glucose, beta-glucose, and

$R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  are each as defined in claim 5, and

m, n, o, p are each as defined in claim 5, and

5  $X^1$  is as defined in claim 5, and

a is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20, and

b is a natural integer and is 2, 3, 4, 5, 6, 7, 8, 9 and 10, and

10 c is a natural integer and is zero, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20.

8. The use of one or more of the initiator systems as claimed in claim 5, 6 and/or 7 for preparing the polymers  
15 as claimed in claim 1.

9. A process for preparing the polymers as claimed in claim 1, characterized in that one or more of the initiator systems as claimed in claim 5, 6 and/or 7 is  
20 used.